

## CLAIMS

1. A system for echo cancellation, comprising:

a double talk detector configured for detecting a double talk condition, wherein said double talk detector operates to detect said double talk condition by monitoring voice energy in a first frequency band;

an adaptive filter configured for producing an echo signal based on a set of coefficients, wherein said adaptive filter holds said set of coefficients constant when said double talk detector detects said double talk condition;

means for inputting audible signals in a second frequency band, wherein said second frequency band is wider and overlaps said first frequency band and said echo signal is used to cancel echo in said input signal.

2. The system as recited in claim 1 further comprising:

a loud speaker for playing voice data in a third frequency band essentially equal to a difference of said first and second frequency bands, wherein said first and third frequency bands essentially makeup said second frequency band.

3. The system as recited in claim 1 further comprising:

2 a control signal for controlling said adaptive filter, to hold  
said set of coefficients constant, based on whether said double talk  
4 detector detects said double talk condition.

4. The system as recited in claim 1, wherein said means for  
2 inputting includes a microphone system, further comprising:

an analog to digital converter configured for producing  
4 voice data, based on said audible signals picked up by said microphone,  
in said second frequency band, wherein said double talk detector  
6 operates on said voice data to detect said double talk condition.

5. The system as recited in claim 2 further comprising:

2 an analog to digital converter configured for producing an audio  
signal within said third frequency band, wherein loud speaker is  
4 configured for playing said audio signal.

6. A method for canceling echo, comprising:

2 monitoring voice energy in a first frequency band for  
detecting a double talk condition;

4 producing an echo signal based on a set of coefficients,  
wherein said set of coefficients are held constant when said double talk  
6 condition is detected;

inputting audible signals in a second frequency band, wherein said  
8 second frequency band is wider and overlaps said first frequency band  
and said echo signal is for canceling echo in said input signal.

7. The method as recited in claim 6 further comprising:

playing voice data in a third frequency band essentially equal to a difference of said first and second frequency bands, wherein said first and third frequency bands essentially makeup said second frequency band.

8. The method as recited in claim 6 further comprising:

producing a control signal for holding said set of coefficients constant, based on whether said double talk condition is detected.

9. The method as recited in claim 6 further comprising:

producing voice data based on said audible signals in said second frequency band, wherein detection of said double talk condition is based on said voice data.

10. The method as recited in claim 7 further comprising:

producing an audio signal within said third frequency band for said playing voice data.

11. A microprocessor system for echo cancellation, comprising:

means for a double talk detector configured for detecting a double talk condition, wherein said double talk detector operates to detect said double talk condition by monitoring voice energy in a first frequency band;

6 means for an adaptive filter configured for producing an  
echo signal based on a set of coefficients, wherein said adaptive filter  
8 holds said set of coefficients constant when said double talk detector  
detects said double talk condition;

10 means for inputting audible signals in a second frequency band,  
wherein said second frequency band is wider and overlaps said first  
12 frequency band and said echo signal is used to cancel echo in said input  
signal.

14  
2 12. The microprocessor as recited in claim 11 further  
comprising:

means for a loud speaker for playing voice data in a third  
4 frequency band essentially equal to a difference of said first and second  
frequency bands, wherein said first and third frequency bands essentially  
6 makeup said second frequency band.

2 13. The microprocessor as recited in claim 11 further  
comprising:

means for a control signal for controlling said adaptive filter,  
4 to hold said set of coefficients constant, based on whether said double  
talk detector detects said double talk condition.

6  
2 14. The microprocessor as recited in claim 11 further  
comprising:

means for an analog to digital converter configured for producing voice data, based on said audible signals picked up by a microphone of said means for inputting, in said second frequency band, wherein said double talk detector operates on said voice data to detect said double talk condition.

15. The microprocessor as recited in claim 12 further comprising:

means for an analog to digital converter configured for producing an audio signal within said third frequency band, wherein loud speaker is configured for playing said audio signal.

16. A device incorporating an echo cancellation system for canceling echo, comprising:

a control system for monitoring voice energy in a first frequency band for detecting a double talk condition and for producing an echo signal based on a set of coefficients, wherein said set of coefficients are held constant when said double talk condition is detected;

a microphone system for inputting audible signals in a second frequency band, wherein said second frequency band is wider and overlaps said first frequency band and said echo signal is for canceling echo in said input signal.

17. The device as recited in claim 16 further comprising:

2 a speaker system for playing voice data in a third frequency  
band essentially equal to a difference of said first and second frequency  
4 bands, wherein said first and third frequency bands essentially makeup  
said second frequency band.

6  
18. The device as recited in claim 16 wherein said control  
2 system is configured for producing a control signal for holding said set of  
coefficients constant, based on whether said double talk condition is  
4 detected.

19. The device as recited in claim 16 wherein said microphone  
2 system is configured for producing voice data based on said audible  
signals in said second frequency band, wherein detection of said double  
4 talk condition is based on said voice data.

20. The device as recited in claim 17 wherein said speaker  
2 system is configured for producing an audio signal within said third  
frequency band for said playing voice data.